

REMARKS/ARGUMENTS

Applicants acknowledge receipt of the Final Office Action dated January 23, 2008.

Status of the Claims:

Claims 1, 6, 14, 37, 51 and 66 are currently amended.

Claims 5, 17 were canceled via previous amendment.

Claims 78-111 were canceled as being drawn to a nonelected invention.

As such, claims 1-4, 6-16, 18-77 and 112-119 are pending in this application.

Applicants retain the right to pursue the subject matter of claims 78-111 at a later time in a divisional application.

Claims 1, 14, 37, 51, 66, and 112 are independent claims from which the rest of the pending claims depend. Applicants believe all pending claims are allowable over the art of record and respectfully request reconsideration and allowance of all claims.

I. Rejections Under 35 U.S.C. §102 (b)

In the Office Action, claims 1-4, 7, and 51 are rejected under 35 U.S.C. §102(b) as being anticipated by Johnson, *et al*, hereinafter "*Johnson*." (U.S. Pat. No 4,404,124). The Examiner states that there is no patentable difference between the catalyst in *Johnson* and the claimed catalyst, and thus rejects claims 1-4, 7, and 51 as being anticipated by *Johnson*. Applicants respectfully traverse.

Claims 1 and 51 are independent claims. Claims 2-4 and 7 depend from Claim 1. According to MPEP 2131, "a claim is anticipated only if each and every element as set forth in the claim is found, either implicitly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir.1987). Applicants respectfully traverse the Examiner's statement on page 2, paragraph 4 wherein the Examiner states there is no patentable difference distinction between the claimed catalyst and that disclosed by *Johnson*.

Claim 1

Claim 1 is an independent claim from which claims 2-4 and 7 depend. Claim 1 is amended herein to recite, “A selective hydrogenation catalyst consisting essentially of: a precursor comprising at least one Group VIII metal disposed on an inorganic support; and a second metal selected from the group consisting of silver, gold, zinc, Group IIIA metals, Group VIIB metals, and combinations thereof, disposed on the precursor; wherein the catalyst comprises ***between 0.1 and 10 weight % Group VIII metal***, and is capable of selectively hydrogenating acetylene with a conversion S_c of at least about 95% and a selectivity to ethylene relative to ethane S_s of at least about 25 when the catalyst is employed in a steady-state liquid phase hydrogenation process.” Support for this amendment is found throughout the specification as filed, for example in original claim 90, which recites, “wherein the finished concentration of Group VIII metal is within the range of 0.1 wt-% to 10 wt-%.”

The catalyst of *Johnson* contains (see column 2 lines 22-24 and claim 1 of *Johnson*, for example), “wherein the palladium is about 0.01 to about 0.025 weight percent of the catalyst.” Thus, *Johnson* does not teach, “***wherein the catalyst comprises between 0.1 and 10 weight % Group VIII metal***,” and fails to anticipate the instant amended independent claim 1.

Furthermore, the silver and palladium catalyst disclosed by *Johnson* does not inherently perform or demonstrate the capability to perform equivalently to the claimed reduced catalyst of the instant independent claim 1. Specifically, the catalyst claimed by *Johnson* does not include screening selectivity (S_s), as given by the molar ratio of *ethylene* to *ethane* (C_2H_4 / C_2H_6), of at least 25 as in the instant amended claim. Contrarily, Figure 1 of *Johnson*, illustrates a maximal screening selectivity of *ethylene* to *ethane* (y-axis: (C_2H_4 / C_2H_6)) of less than 1.9. Additionally, *Johnson* recites (see column 5, lines 37-40 of *Johnson*), “the value of 1.685 for a molar ratio of *ethane* to *ethylene* was selected since that is a value where runaway is exhibited with Catalyst A” (emphasis added). *Johnson* nowhere discloses that the claimed catalyst exhibits, “selectivity to ethylene relative to ethane S_s of ***at least about 25*** when the catalyst is employed in a steady-state liquid phase hydrogenation process.”

The silver and palladium catalyst of *Johnson* does not comprise between 0.1 weight t% and 10 weight % Group VIII metal,” and is also not inherently “capable of selectively hydrogenating acetylene with a conversion S_c of at least about 95% and a selectivity to ethylene relative to

ethane S_s of at least about 25 when the catalyst is employed in a steady-state liquid phase hydrogenation process.” Thus, there is a substantial distinction between the catalyst disclosed by *Johnson* and the catalyst as claimed in the instant amended claim 1.

As claims 2-4 and 7 depend from claim 1, they carry with them each and every limitation of claim 1. Because each and every element as set forth in the claims is not, either implicitly or inherently described in *Johnson*, *Johnson* does not anticipate the catalyst of independent claim 1. It is respectfully requested that the 35 USC§102(b) rejection to claim 1 and claims 2-4 and 7 as they depend from therefrom be removed and the claims allowed.

Claim 51

In paragraph 2 on page 3 the Final Office Action, the Examiner states that, “Johnson discloses the claimed catalyst and thus anticipates the claims.” Applicants respectfully traverse.

Claim 51 is an independent claim from which claims 52 through 65 depend. Claim 51 is herein amended to read: “A supported catalyst for selective hydrogenation consisting essentially of: a Group VIII metal and a second metal selected from the group consisting of gold, silver, zinc, Group IIIA metals, Group VIIB metals, and combinations thereof disposed on a support, ***wherein the concentration of Group VIII metal is within the range of from about 0.1 wt-% to about 10 wt-%;*** and having a single-pass conversion S_c of at least 90% in liquid-phase hydrogenation of acetylene.”

Support for this amendment to independent claim 51 maybe found throughout the specification as filed, for example in original claim 90, which recites, “wherein the finished concentration of Group VIII metal is within the range of 0.1 wt-% to 10 wt-%.”

As mentioned hereinabove with respect to independent claim 1, *Johnson* fails to teach, “wherein the finished concentration of Group VIII metal is within the range of 0.1 wt-% to 10 wt-%,” and indeed teaches (see column 2 lines 22-24 and claim 1 of *Johnson*, for example) “wherein the palladium is about 0.01 to about 0.025 weight percent of the catalyst.” Thus, *Johnson* fails to anticipate the catalyst as claimed in the instant amended claim 51.

Because each and every element as set forth in amended claim 51 is not, either implicitly or inherently, described, in *Johnson*, *Johnson* does not anticipate the catalyst of independent claim 51.

It is respectfully requested that the 35 USC§102(b) rejection to claim 51 be removed and the claim allowed.

II. Rejections Under 35 U.S.C. §103 (a)

In the Office Action claims 6, 8-16, 18-50 52-77 and 112-119 are rejected under 35 U.S.C. §103(a) as being unpatentable over *Johnson* as applied to claims 1-4, 7 and 51 in further view of *Ryu et al*, hereinafter *Ryu*, U.S. Pat No. 6,576,582 B2. Applicants respectfully traverse the Examiner's rejections of claims 6, 8-16, 18-50, 52-77 and 112-119 under §103(a) as being unpatentable over *Johnson* in view of *Ryu*.

As mentioned hereinabove, claim 1 is an independent claim from which claims 6 and 8-13 depend; claim 14 is an independent claim from which claims 15-16 and 18-36 depend; claim 37, is an independent claim from which claims 38-50 depend; claim 51 is an independent claim from which claims 52-65 depend; claim 66 is an independent claim from which claims 67-77 dependent and claim 112 is an independent claim from which 113-119 depend.

In paragraph 1 on page 4 of the Final Office Action, the Examiner states, "Johnson discloses a catalyst as described above, except for the second metal component being zinc, Group VIIB or Mn, Group III metals or In, Ga, etc. recited in the above listed claims." The Examiner goes on to state that, "it would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made to have incorporated these known active metal components into the catalyst of *Johnson* in order to achieve an improved and effective catalyst material because they are known as useful catalytic materials, as evidence by *Ryu* (see *Ryu* at col. 18, claim 7)." Applicants respectfully traverse, and, as discussed in Sections I above, submit that *Johnson* fails as a primary reference.

As discussed in Section I hereinabove, *Johnson* fails to disclose, "wherein the catalyst comprises between 1 wt% and 10 wt% Group VIII metal." As with independent claims 1 and 51, independent claims 14, 37 and 66 have been amended herein to recite a similar limitation, and previously presented claim 112 comprises the limitation, "0.1% - 1.0% by weight of the first metal to final weight of the catalyst." *Ryu* is not cited for making up for the lack of teaching by *Johnson*. It is thus respectfully submitted that a combination of *Johnson* and *Ryu* fails to disclose the composition and/or catalyst as disclosed in independent claims 1, 14, 37, 51, 66, and 112. As

claims 8-13, 15-16, 18-36, 38-50, 52-65, 67-77 and 113-119 depend from claims 1, 14, 37, 51, 66 and 112, they are submitted to be allowable for at least the reasons presented for independent claims 1, 14, 36, 51, 66 and 112, that is for the lack of disclosure of *from 0.1 to 10 weight%* (independent amended claims 1, 14, 37, 51, and 66) *from 0.1 to 1.0 weight percent* (previously presented claim 112).

Furthermore, as detailed in Section 1 above, the primary reference *Johnson* does not teach or suggest the screening selectivities (S_s) or the single-pass conversions in liquid phase hydrogenation of acetylene, as disclosed in the independent claims. The secondary reference, *Ryu*, is not cited by the Examiner for the purpose of providing these missing elements of independent claims 1, 14, 37, 51, 66 and 112. As *Johnson* and *Ryu* do not disclose the composition/catalyst/process as disclosed in the independent claims, the Applicants respectfully submit that the pending claims are patentable over the combination of *Johnson* and *Ryu*.

Ryu claims “a catalyst for selective hydrogenation of acetylenes comprising a copper component and a member selected from the group consisting of at least one Group VIII metal component, a Ag component, a Au component and mixtures thereof on an alumina support.” The catalyst of *Ryu*, thus necessarily comprises a copper component. Thus, the invention of *Ryu* is a “*copper* catalyst” or a “palladium promoted *copper* catalyst,” and copper is a critical component of the *Ryu* invention.

MPEP 2164.03 states

“[I]n the field of chemistry generally, there may be times when the well-known unpredictability of chemical reactions will alone be enough to create a reasonable doubt as to the accuracy of a particular broad statement put forward as enabling support for a claim. This will especially be the case where the statement is, on its face, contrary to generally accepted scientific principles. Most often, additional factors, such as the teachings in pertinent references, will be available to substantiate any doubts that the asserted scope of objective enablement is in fact commensurate with the scope of protection sought and to support any demands based thereon for proof.” In re Marzocchi, 439 F.2d 220, 223-24, 169 USPQ 367, 369-70 (CCPA 1971).

As noted above, and commonly acknowledged by those skilled in the art, the catalytic arts are inherently unpredictable. The use of second metals in the *copper* catalyst of *Ryu* does not teach that the addition of such metals to the *palladium-silver* catalyst of *Johnson* will, as the Examiner states, “result in an effective catalyst in *Johnson* because it is known and evidenced by *Ryu* the claimed amounts are effective.” Further, as mentioned above, combining the teaching of *Ryu*’s

copper catalyst and Johnson's platinum-silver catalyst would not produce the composition/catalyst of independent claims 1, 14, 37, 51, 66, and 112, as such a catalyst would, as disclosed by Johnson, have a content of palladium in the range of 0.01 weight percent to 0.025 weight percent. Therefore, combining the teaching of Ryu, as suggested by the Examiner in paragraph 1 on page 4 of the Final Office Action, as to the secondary component being selected from being zinc, Group VIIB or Mn, Group III metals or In, Ga, would not lead to a composition/catalyst having from 0.1 wt% to 10 wt% Group VIII metal, because the primary reference, Johnson, teaches "wherein the palladium is about 0.01 to about 0.025 weight percent of the catalyst." Furthermore, one of skill in the art, upon reading Johnson would not expect to produce a hydrogenation catalyst having the selectivities and/or once-through conversions disclosed in the instant independent claims by combining the teachings of Ryu with those of Johnson.

Because a combination of the cited references does not teach the composition, catalyst or process as disclosed in independent claims 1, 14, 37, 55, 66, and 112, it is respectfully requested that the 35 U.S.C. §103(a) rejections to claims 6, 8-16, 18-50 52-77 and 112-119, depending therefrom, be removed, and the claims allowed.

III. Additional Comments

Originally presented claims 22-30 which depend from independent claim 1, original claims 39-44 which depend from independent claim 37, claims original 54-55 which depend from independent claim 51, original claims 67-68 which depend from independent claim 66, and previously presented claim 114 which depends from independent claim 112 comprise limitations regarding the amounts of first and/or second metals which are outside the range disclosed by Johnson. If the Examiner maintains rejections to these claims in a future Office Action, the Examiner is respectfully requested to provide, by line and page number, the location of the disclosure of such limitations in the cited art.

Similarly, original claim 118 teaches reduction of the precursor, "in an atmosphere consisting of approximately 2:1 mixture of H₂:CO." It is respectfully requested that, should the Examiner maintain rejection to claim 118, that the Examiner point out specifically where such teachings of reduction of a precursor in carbon-monoxide-containing gas is disclosed in the cited art.

IV. Other Claim Amendments

Claim 6 is herein amended to correctly depend from claim 1 rather than from canceled claim 5.

CONCLUSION

Applicants respectfully request reconsideration, allowance of the pending claims and a timely Notice of Allowance be issued in this case. If the Examiner feels that a telephone conference would expedite the resolution of this case, the Examiner is respectfully requested to contact the undersigned.

In the course of the foregoing discussions, Applicants may have at times referred to claim limitations in shorthand fashion, or may have focused on a particular claim element. This discussion should not be interpreted to mean that the other limitations can be ignored or dismissed. The claims must be viewed as a whole, and each limitation of the claims must be considered when determining the patentability of the claims. Moreover, it should be understood that there may be other distinctions between the claims and the prior art that have yet to be raised, but which may be raised in the future.

If any fees are inadvertently omitted or if any additional fees are required or have been overpaid, please appropriately charge or credit those fees to Conley Rose, P.C. Deposit Account Number 03-2769.

Respectfully submitted,

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